



Space Age Spuds

Around the world, many countries lack an adequate supply of healthy potatoes, a staple crop capable of feeding many people. A new technique for growing seed potatoes using NASA technology has the ability to change all that. By combining a growing technique from China with NASA-developed growth chambers, American Ag-Tec International, Ltd., of Delavan, Wisconsin, has developed a system they call Quantum Tubers.™

American Ag-Tec International worked with the Wisconsin Center for Space Automation and Robotics (WCSAR), a NASA-sponsored Commercial Space Center located at the University of Wisconsin-Madison. NASA's Commercial Space Centers assist companies to develop products derived from space based research as part of the Space Product Development Office at Marshall Space Flight Center.

Using computerization and technologies originally intended for growing plants in outer space, American Ag-Tec and WCSAR developed a growth chamber that accelerates plant growth, and is free of plant pathogens. This unique growth chamber provided the perfect vehicle for taking advantage of a Chinese technique for growing minitubers, which serve as nuclear seed stock for potatoes.

Typically, minitubers are grown from tissue-cultured plantlets inside traditional greenhouses. There is little control over the environmental conditions such as light and temperature, so that only one small crop of minitubers can be produced annually. In China, researchers moved the small plants to different locations in the greenhouse to create the maximal environmental conditions.

NASA's growth chambers provided the solution to these problems. Using unique lighting technology, high-efficiency temperature and humidity controls, and automation technology, the minitubers can be generated in one closed facility without the labor-intensive handling. Also, the self-sustaining chambers bring production indoors, removing the grower's dependence on weather or



Quantum Tubers™ potato minitubers weigh 0.3 to 0.5 grams and produced the potatoes in the background.

the sun. This allows minitubers to be grown year-round in extreme environmental settings, such as deserts or excessively cold regions.

The ability to accelerate the growth cycle of minitubers allows for the introduction of new varieties of potatoes to the commercial market within two years of developing the nuclear generation of seeds. Previously, seed multiplication could take up to seven years of planting, cultivating, and harvesting to multiply a sufficient stock of seed potatoes for commercial planting.

American Ag-Tec's new system eliminates the need for multiple generations of seed. The minitubers are pathogen-free and not exposed to diseases and pests that can reduce seed stocks. The Quantum Tubers system can produce 10 to 20 million tubers throughout the year, about equal to the world's supply of this generation seed stock. The system also lends itself to creating genetically altered potatoes and even potentially growing plants that produce edible vaccines.

American Ag-Tec has sold its first franchise of the Quantum Tubers system and expects it to produce minitubers in Poland this year. Robert Britt, president of American Ag-Tec, foresees use of the system in other developing countries. Because many of these countries import seed potatoes, they can save millions using the Quantum Tubers technology.

Quantum Tubers™ is a trademark of American Ag-Tec International, Ltd.